~~Patent claims~~ WHAT IS CLAIMED IS

1. A method for the wireless data transmission using one or more transmitters and at least one receiver, in which

- the receiver uses one or more receiving antennas,
- information on received interference signals is utilized for improving the quality of transmission of the data transmission,
- in a first step, quantitative information about received user signals is obtained from the received signals of the individual antennas by using first signal processing algorithms,
- and in a second step, quantitative information about the received interference signals is obtained from the received signals of the antenna or the individual antennas and the quantitative information obtained about the received user signals by using second signal processing algorithms,

characterized in that the quantitative information about the received interference signals is used for generating a directional pattern at the transmitter end.

2. The method as claimed in claim 1, characterized in that the first signal processing algorithms provide for an estimate of the transmitted user data.

3. The method as claimed in claim 1, characterized in that the first signal processing algorithms provide for an estimate of the characteristics of the radio channels operating between the transmitters and the receiver.

4. The method as claimed in one of the preceding claims, characterized in that

the second signal processing algorithms contain algorithms for reconstructing the user signals received from the receiving antenna/the receiving antennas by means of the quantitative information obtained about these signals.

5. The method as claimed in claim 1 or 3, characterized in that the second signal processing algorithms contained a weighted or unweighted subtraction of the reconstructed received user signals from the total received signals.

6. The method as claimed in one of the preceding claims, characterized in that the second signal processing algorithms contain the forming of the spatial covariance matrix of the received interference signals.

7. The method as claimed in one of the preceding claims, characterized in that the second signal processing algorithms contain the forming of the temporal covariance functions of the received interference signals at the individual antennas.

8. The method as claimed in one of the preceding claims, characterized in that the second signal processing algorithms contain the forming of the total covariance functions of the received interference signals.

9. The method as claimed in one of the preceding claims, characterized in that the second signal processing algorithms contain the estimating of the spatial, temporal and/or total covariance functions by finite temporal averaging over the received interference signals.

10. The method as claimed in one of the preceding claims,

characterized in that the second signal processing algorithms contain the estimating of the directions of incidence of the interference.

11. The method as claimed in one of the preceding claims, characterized in that the second signal processing algorithms contain the estimating of the power and/or the spectral shape of the interference.

12. The method as claimed in one of the preceding claims, characterized in that the first signal processing algorithms contain the forming of the spatial covariance matrix of the received user signals.

13. The method as claimed in one of the preceding claims, characterized in that the first signal processing algorithms are based on the principle of single user detection in the case of data transmission.

14. The method as claimed in one of the preceding claims, characterized in that the first signal processing algorithms are based on the principle of multi-user detection in the case of data transmission.

15. The method as claimed in one of the preceding claims, characterized in that the first signal processing algorithms are based on the principle of the rake receiver in the case of data transmission.

16. The method as claimed in one of the preceding claims, characterized in that the first signal processing algorithms include FEC (forward error correction) decoding at the receiver end in the case of data transmission.

17. The method as claimed in one of the preceding claims, characterized in that the first signal processing algorithms are based on the principle of the zero-forcing algorithm.

18. The method as claimed in one of the preceding claims, characterized in that the first signal processing algorithms are based on the principle of maximum-likelihood estimation or MMSE (minimum mean square error) estimation.

19. An arrangement for carrying out the method as claimed in claim 1.

Key to figure

1 Channel estimator
2 Common detector for the subscriber signals
3 FEC decoder
4 FEC coder
5 Signal reconstructor
6 Estimator for $\underline{R}_n$